Research Article

The epidemiological determinants of prostate cancer: a retrospective analytical study

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Abstract

Introduction: The study of the epidemiological profile of cancers is one of the pillars of the population's health problems and their determinants. One of the objectives of this type of prospecting is to analyze the impact of behavioral, environmental and professional factors.

Material and methods: This is a retrospective study conducted in our university hospital center, including 120 patients followed for prostate cancer over two years between January 2018 and December 2019. The choice of patients was subject to a number of criteria inclusion and exclusion. The quantitative and qualitative variables were described by their proportion and their percentage. Descriptive statistical analysis of the data was performed using SPSS 20 software.

Results: In our study we objectified 42% of our patients had no specific history, 65.5% of our patients were smokers, 16% were alcoholics, 69.1% had red meat consumption deemed excessive. The prostate was hard on digital rectal examination in 39.62% of cases, unilateral nodular in 47% of cases, and normal in 13% of cases. We separated our patients into three groups according to the risk factors, group 1 without risk factors, group 2 with 1 risk factor, and group 3 with at least 2 risk factors, in the same way, we tried to establish a correlation with the presence or absence of metastases.

Conclusion: Prostate cancer in its metastatic stage is very common in our context unlike in developed countries where screening can detect cancer at an early stage. The study of risk factors in our university center allowed us to identify the epidemiological profile of cancer in our hospital structure.

Introduction

Prostate cancer is the first cancer in men over 50; it is also the leading cause of morbidity and mortality in the elderly. The early diagnosis of prostate cancer as well as the aging of the population makes this pathology a public health problem on a global and national scale. However, despite all these efforts, prostate cancer is often diagnosed at an advanced stage, especially in our Moroccan context. It is, therefore, necessary to implement means to prevent, detect, and treat this pathology more quickly. This study aims to draw up an epidemiological profile of prostate cancer in our university structure. Thus to determine the risk factors, the suggestive signs, and the stage of diagnosis of the pathology.

Material and methods

This is a retrospective study conducted at the Ibn-Rochd University Hospital in Casablanca, including 120 patients followed for prostate cancer over 2 years between January 2018 and December 2019.

Have been included in our work:

I.   All patients followed for prostate cancer

II. All usable files containing an extension report.

An operating sheet was produced to collect clinical and paraclinical epidemiological data. The quantitative and qualitative variables were described by their proportion and their percentage. Statistical analysis was Data were analyzed by SPSS 20 software.

Results

He average age is 70.82 years, extremes between 59 and 86 years. The most represented age group ranged from 68 to 71 years. The patients were city dwellers in 79% of cases. 42% of our patients had no specific history. The two main antecedents were high blood pressure in 20% of cases, and inguinal hernia repair in 16.4% of cases, other histories include COPD and diabetes. We noted two cases of prostate cancer in the siblings and one in the father. 65.5% of our patients were smokers, 16% were alcoholics, 69.1% had red meat consumption deemed excessive. 45% of our patients had a low socioeconomic level, 55% had an average socioeconomic level. 71% of our patients had normal physical activity, compared to 29% of patients who had low physical activity. The circumstances of discoveries are first of all disorders of the lower urinary tract, then an increase in the PSA level, then an abnormality of the digital rectal examination or a fortuitous discovery on resection chips as presented in the graph below (Figure 1). The prostate was hard on digital rectal examination in 39.62% of cases, unilateral nodular in 47% of cases, and normal in 13% of cases. The average PSA level was 207.93ng/ml with extremes ranging from 5.27 to 1302ng/ml. The standard deviation is 330.03ng/ml. We subdivided our patients into 4 groups for better staging according to the level of PSA:

I.   Group 1 with a PSA <10 ng / ml: 17 cases,

II. Group 2 with a PSA between 10 and 20 ng / ml: 12 cases

III. Group 3 with a PSA between 20 and 100 ng / ml: 27 cases

IV. Group 4 with a PSA> 100 ng / ml: 64 cases.

The general condition of our patients was measured using the performance status noted from 0 to 4. 62% of our patients had a PS of 1. 16% had a PS of 0. 14% had a PS of 2. The most frequent Gleason score was 7 (4 + 3 and 3 + 4 combined) followed by the score 9 and 8

then the score 6, as shown in the following graph (Figure 2). Both lobes were pathologically affected in 62% of cases. Vascular involvement was noted in 56% of cases. The extension workup consisting of bone scintigraphy and thoracoabdominal-pelvic computed tomography was performed in almost all of our patients. On the other hand, MRI was only performed on 30 of our patients in our series. Bone scintigraphy showed bone metastases in 58% of cases. The main localization was the pelvis 66.67%, the spine 60% then the ribs 10%. Lung involvement was noted in 33% of cases. Lymph node involvement in 48% of cases and visceral involvement, especially hepatic involvement in 7% of cases. Prostate MRI showed capsular rupture in 86.7% of cases.
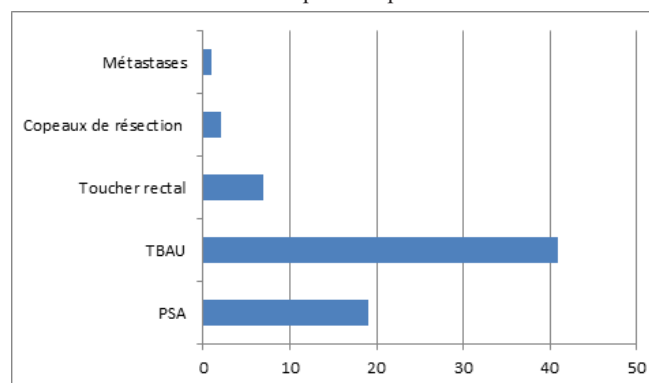

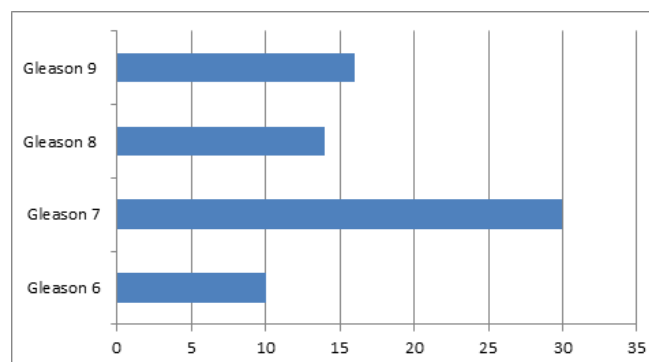**Figure 1** Circumstance of discovery of prostate cancer.

Figure 2 Gleason score.

From an analytical point of view, we note in patients with a PSA <10 ng / ml, the Gleason ranged from 6 to 8 with a predominance of Gleason 6 in 59% of cases, in this same category the rectal examination showed only one lobe in 64% of cases, the extension assessment was negative in 14 out of 17 patients. Note that in this group of patients, the risk factors sought are little or not present (smoking, carnivorous food, alcoholism). The second group of patients has a PSA level between 10 and 20 ng / ml, Gleason 7 is present in 75% of cases, digital rectal examination shows unilateral damage (nodule) in 92% of cases. The paraclinical assessment shows metastases in 9% of cases at the bone level. The third group of patients has a PSA level between 20 and 100ng / ml, the Gleason score is shown in the following graph (Figure 3). A digital rectal examination finds a prostate that is hard in its entirety in 37% of cases, lumpy on one side in 59% of cases, and normal in 4% of cases. The extension workup found metastatic involvement in 74% of cases, the latter being multiple metastatic in 55% of metastatic patients. The last group of patients have a PSA level>100ng / ml; the Gleason is 8 in 62% of cases, the digital rectal examination is hard in 86% of cases. The involvement is metastatic in 91% of cases and poly-metastatic in 84% of metastatic patients. We separated our patients into three groups according to the risk factors,

group 1 without risk factors, group 2 with 1 risk factor, and group 3 with at least 2 risk factors, in the same way, we tried to establish a correlation with the presence or absence of metastases as shown in the figure below (Figure 4).
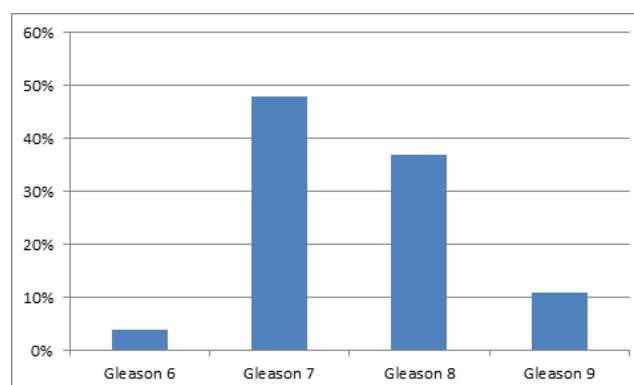

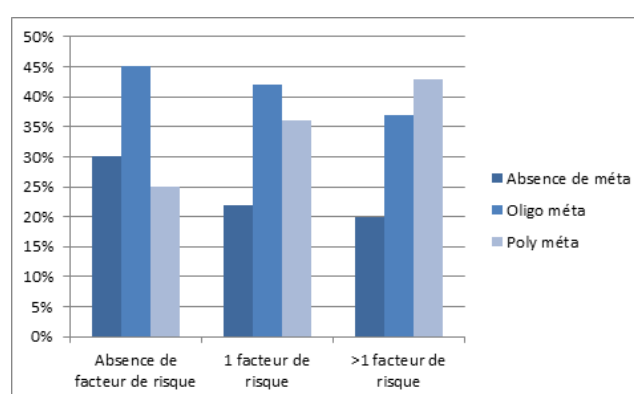**Figure 3** Gleason stage in patients with PSA between 10 and 20ng / ml.

Figure 4 Correlation between risk factors and metastasis.

Discussion

Prostate cancer is a public health problem, global registers show that there is a wide variation in incidence between countries, and disparities are also observed according to ethnic origin.[1] The American Cancer Society has estimated the increase of the population over 65 years of 12.4% to 19.6% between 2004 and 2030, thus the number of prostate cancer is expected to multiply by 4 in 2030.[2,3] In the Maghreb countries, there are few data, prostate cancer is generally discovered at an advanced or late-stage.[4,1] The Rabat urology service carried out an epidemiological study over 6 years, between 2000 and 2006, having objectified a sample of 258 cases.[5] According to the register of greater Casablanca, the incidence has been sharply increasing over the 3 years recorded to reach 15.6/100,000 inhabitants in 2007 with 548 new cases between 2005 and 2007.[5] Prostate cancer is rare before the age of 50, but its incidence then increases sharply, more than 75% of prostate cancers are diagnosed after 65 years in France.[6,7] In the United States, the incidence of prostate cancer is 21/100 000 before age 65 compared to 819/100 000 after age 65.[6] Our series matches the different studies, with a predominance of the 68 to 71 age group and an average of 70.82 years. These data make prostate cancer a public health problem of the future, given improving life expectancy.

The only risk factors currently identified with certainty are age, the existence of family history or ethnicity. Several environmental factors may promote or protect prostate cancer.[8] We noted in our study

3 patients with cases in the family (brother or father) several studies have shown that belonging to a family or there are cases of prostate cancer in the family would increase the risk of 1.6 to 11 times.[9] Red meat has been implicated in prostate cancer, through polyunsaturated fatty acids,[10] in our study 69.5% of cases have excessive red meat consumption. In addition to its role in the morbidity and mortality of prostate cancer, several studies have shown that the risk of presenting metastases increases by 151% in smokers in our study we note an increase in metastases in smokers 80% against 70% in non-smokers, moreover, the metastatic burden is even greater 25% of poly metastases in non-smokers against 43% of poly metastases in smokers. Some studies have shown a correlation between physical activity and the lower risk of prostate cancer, indeed physical activity seems to be a protective factor against prostate cancer, however, in our study with a non-significant p-value we do not can we comment on the impact of physical activity on prostate cancer. Likewise, there does not appear to be a significant personal history that may be correlated with prostate cancer or its severity based on the results of our study. Prostate cancers are diagnosed in 80% of cases following symptoms of the lower urinary tract. Bone pain is also a mode of revelation, especially in metastatic patients in 40% of cases.[11,12] The digital rectal examination is insufficient since it ignores one in two cancers, however 25% of prostate cancers are diagnosed on a rectal examination, with normal PSA levels.[13] In our study, 43% of prostate cancers were found in disorders of the lower urinary tract, 19% in a PSA test during a consultation. However, one must take into consideration the peculiarity of the Moroccan patient, who does not describe a disorder of the lower urinary tract that he considers normal, even if they are present. The delay in consultation despite the symptoms means that the cases are generally discovered late.

The correlation between digital rectal examination, PSA level, and Gleason follows the results of different studies. Indeed, a high PSA level is generally associated with a high Gleason and vice versa. Also, by laminating our cases according to the Amico classification, we note a higher metastasis rate in high-risk patients (88%) compared to low-risk patients (17%). These results are consistent with those of the literature. Overall, the higher the PSA level, the greater the risk of bone, lymph node, and visceral metastasis.[14] In our study, bone involvement is in first place with the involvement of the spine and pelvis. Lymph node involvement precedes visceral involvement in all of our cases, likewise bone involvement is present in all patients with lymph node or visceral involvement. This is in line with the studies carried out in this direction.[15] The essential role of MRI is to diagnose extracapsular extension. Indeed, it has a variable sensitivity of 13 to 95% for the extracapsular extension and from 20 to 83% for the extension to the seminal vesicles; and a better specificity of 49 to 97% for extra prostatic invasion and 92% to 98% for seminal vesicles.[16]

Conclusion

Prostate cancer is a common pathology in our country, especially at a metastatic stage unlike in developed countries where screening can detect cancer at a curable stage. The best treatment, therefore, remains the detection and early diagnosis of intracapsular cancer which remains curable, unlike metastatic pathology. The profile of affected patients is marked by smoking and a diet rich in red meat.

Conflicts of interest

The author declares there is no conflict of interest.

References

1. Khaouja K, Ben Sorba N, Bouslama A, et al. Une experience de diagnostic individuel et précoce du cancer de la prostate dans un centre de la Tunisie. *Prog Urol*. 2005;15:255–259.

2. Parkin DM, Bray FI, Devesa SS. Cancer burden in the year 2000. The global picture. *Eur J Cancer*. 2001;37(suppl8):S4–S66.

3. Quinn M, Babb P. Patterns and trends in prostate cancer incidence, survival, prevalence and mortality. Part I: intenationnal comparisons. *BJU Int*. 2002;90:162–173.

4. Evans HS, Moller H. Recent trends in prostate cancer: incidence and mortality in Southeast England. *Eur Urol*. 2003;43:337–341.

5. A Ammani, A Janane, J Chafiki. Service d'urologie Hôpital Militaire d'instruction Mohammed V Rabat, *Maroc Urol*. 2007;5:14–14.

6. Molinié V, Vieillefond A, Cochand-Priollet B. Recommandations pratiques pour les prélèvements prostatiques. *Ann Pathol*. 1999;19:549–556.

7. Parkin DM, Bray FI, Devessa SS. Cancer bruden in the year 2000. The global picture. *Eur J cancer*. 2001;37(suppl8):S4–S66.

8. Gronberg H, Damber L, Damber JE. Studies of genetic factors in prostate cancer in a twin population. *J urol*. 1994;152(5Pt1):1484–1489.

9. Ahmad N, Feyes DK, Nienimen AL, et al. Green tea constituent epigallocatechin-3-gallate and induction of apoptosis and cell cycle arrest in human carcinoma cells. *J Natl Cancer Inst*. 1997;89(24):1881–1886.

10. Boyle P, Severi G, Giles GG. The epidemiology of prostate cancer. *Urol Clin North Am*. 2003;30(2):209–217.

11. Classileth BR, Vickers AJ. Complementary and alternative therapies. *Urol Clin North Am*. 2003;30:369–337.

12. Kyprianou N, Issacs JT. Identification of a cellular receptor for transforming growth factors in rat ventral prostate and its negative regulation by androgens. *Endocrinology*. 1998;123(4);2124–2129.

13. Cancer de la prostate: diagnostic et bilan d'extension. *Encycl méd-chirurgicalee*. 18-560-A-12, 2004.

14. Yehui Chen, Yun Lin, Pin Nie, et al. Associations of Prostate-Specfic Antigen, Prostate Carcinoma Tissue Gleason Scrore, and Androgen Receptor Expression with Bone Metastasis in patients with Prostate Carcinoma. *Med Sci Monit*. 2017;23;1768–1774.

15. C Mcarthur, Mclaughiin, N Meddings. Changing the referral criteria for bone scan in newly diagnosed prostate cancer patients. *The British Journal of Radiology*. 2012;85:390–394.

16. Benider A, Harif M, Karkouki M, et al. *Registre des cancers de la region Du Grand Casablanca*. 2005, 2006,2007. Edition 2012. p. 1–204.